

Kanab
Canyon
Arizona

Wednesday Oct 15th 1879.

Up early and Jerry prepared to leave for Kanab to carry in a pack of fossils, letters, and to bring mail in return. The morning was a dismal one. Cold. cloudy & windy. A late fall day. Cleared up a little and grew warmer towards night.

I went five or six miles south and measured a portion of the sandstone of the upper division of the Carboniferous. Yesterday took the measurement of the upper portion by level and barometer. Each gave 775 feet. To day added 615 feet more. These measurements are much greater than those obtained by Mr. Gilbert so I took unusual pains to have them correct.

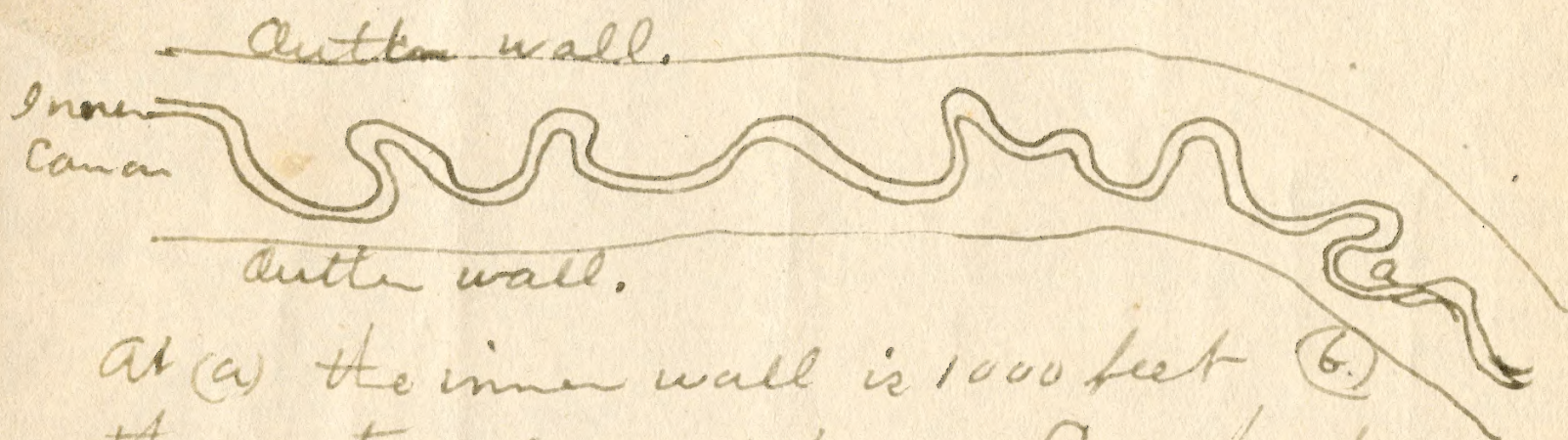
Returned and prepared my supper & then, caught a few *Branchipus*.

after eating it. This is the first
time I ever saw these beautiful
little crustaceans alive. At sunset
the eastern cliffs were very beautiful
as the dark red base and gray
~~mass~~ above ^{was} capped by a golden
crum, as the sunlight just touched
the summit. The afterglow was
also fine after the sun had set.

Very tired. Wrote a little &
~~turned in.~~ Alone in my tent.
16th. Awoke at daybreak and heard
a loud report, a rumble and then the
rolling of rocks down the canon. A portion
of the cliff had broken off. The sunrise
salute. Went up the east side 1600 feet
& measured the sandstone & limestone,
also secured a fine lot of fossil sponges
from the chert nodules. Returned and
prepared for the night. Just after
dark Jerry came bringing 14 letters
and a great pile of papers. Two
weeks mail. How pleasant it was

to read those from home. To learn
of the welfare of loved ones and
the general life of all my home
friends. Sig. G. Cappelhini of Bologna
Italy writes acknowledging the receipt
of my Utica slate paper & invites me to
meet him at Bologna 1881. at the Inter-
national Congress of Geologists. Prof.
Geinitz of Dresden also acknowledges
receipt of U.S. paper, but as it is
written in German I cannot read it.
One of the heaviest of an imperfect
education. Left papers for future
reading. After breakfast next morn-
ing packed and started down the
canon. Entered the Massie sand-
stone at leaving camp and for
several miles the canon gradually
deepened until we were in a canon
within a canon. The outer walls
retreating back leaving the cut in
the sandstone. Now & then we
caught a glimpse of the white

limestone 2000 feet above and
back from the inner canon. The
inner canon curves and winds
down thro' the sandstone and then
into the sandstone beneath.



At (a) the inner wall is 1000 feet (b)
the outer 1700 at (b). Camped
at night beside a water pocket.
a hole in the bed of the stream. The
canon is very narrow. Not over three
rods broad & the solid limestone,
stained red, rises 1000 feet to the
loam. The high walls back cannot
be seen. The change from the sand-
stone with its curious and beauti-
ful sculpture and picturesque
coloring to the massive perpendicular
limestone wall is very striking. It
seems a lonely and long journey down
this canon, but no true places here
treasures and rare beauties where

energy and work is necessary to obtain or see them. Thus far my trip has well repaid the labor by the simple seeing the beautiful and grand features of the natural scenery, not to mention the knowledge gained by a study of the geological structure. Twilight is falling & it is short in this region so will prepare to rest as the tent will not be put up to night. Will read by the firelight and turn in early.

Oct 18th. Last night I lay awake a long time looking up at the stars. The canon walls formed an oval frame to a beautiful blue sky. The north star forming the center of the northern end and towards midnight Jupiter the center of the southern extremity. The quiet broken only by the stirring of our animals. The gloom of the great canon and above all the blue sky and bright stars above gave an impression

of the solemnity of nature in the hour when she is at rest that will not soon be effaced.

Up at daybreak, breakfasted, collected a few fossils and then bid adieu to our camp. All were glad to leave it. a puddle to drink from and no feed for the animals. The caravan continued to wind first east then west and in fact to all points of the compass. The trail was good and a few miles down a little clear water was seen in the bed of the channel and soon a small brooklet glided over the rocks. Spring added to its volume and to night the music of a noisy brook broke the stillness.

On our way down the canon a drove of cattle was ahead of us. At one point they stopped & refused to be driven ahead. We let them pass by and found a rocky barrier in our path. By an hour's work a path was formed and we passed over only to find a still greater mass of fallen rocks with

a deep pool of water between two high
blocks of limestone. Off with the packs &
saddles drive the animals in for a
swim. Carry the luggage over the rocks
repack & then find the trail obstructed
again. A log 20 feet long is hauled by
ropes up the side of a slanting rock
fastened there and stones & dirt thrown
against it to form a path. The
white mule rebels, lies down, rolls
half over. Unpack pull him up,
beat well for future administration
to repeat the copier. Since here over
carry the pack & start down the
Canon. The sun is getting low so a
level fresher sand beach is selected and
the tent put up. A hearty supper
& soon the cares of the day are forgotten
in reading & writing. The grass is
high along the stream & all are
content once more.

One object not mentioned is worthy of it.

Soon after reaching the running water
a mass of green was seen ahead attached
to the side of the cliff. Approaching, it
was seen to be a great cluster of a plant
attached to the cliff when a spring
came out. Jutting out from the
cliff twenty feet and so high a horse
could pass under. The leaves were
small & of a deep olive green, scattered
thickly over the entire mass were star
shaped, brilliant scarlet flowers. Thro'
the mass the water penetrated and
drained down as from a great sponge.
It was quite a refreshing sight
as nothing of the character has
been seen in many a long day.
Tomorrow is Sunday & I hope it will
be a day of rest for man & beast as
all need it. A ^{enormous} ~~enormous~~ mass of lime-
stone has fallen from the cliff a short
distance below & a trail must be built
over or around it. (50 miles from the
nearest house we lie down to sleep
quietly and without fear.

the same Father⁹ watches over us here
that does at ~~from~~ home and life is
secure by care and foresight owing
to its protection.

Sunday P.M. 19th Oct.
after breakfast climbed up the cliff
a hundred feet to a damp spot &
found a great cluster of ferns and
wild plants. The fern resembles
our own beautiful maiden hair
and altho' not as delicate and
graceful may be a variety of it or
another species of the same genus.

Adiantum. Clipped coming down
& fell whereby getting a black
thumb nail & a sore thumb. Read
papers until noon. ate a lunch and
went down the canon to examine the
canon & trail. We can pass the
fallen limestone by going over a
very rough & steep mass of rock and
dirt. a hard looking road. Blocks
of limestone $40 \times 50 \times 30$, 160000 cubic
feet are piled where the trail formerly
led. The mass has fallen recently

as the dust has not washed off
the rocks. What a sight it would
have been to have seen this
great mass 1000 feet high topple
over & plunge into the canon
beneath filling it to a depth of
100 feet. Luckily it was in a broad
portion of the canon, or our path
would have been permanently
obstructed. The cliff looks as tho.
it had lost a chip off its red
surface leaving a long white
scar. Small masses fall fre-
quently as we have seen them
fishily broken lying in the bed
of the canon. I trust they will
hold up until we return thro
the canon and by then I
do not care to be blocked in here
or crushed. To die here would
be unfortunate. Not so much to me
as to those left behind. I prefer
to meet that friend or foe as the
case may be among those that
save a core for my comfort and

the case of that left with them
to a soul that lives the throbs of
love was paying the tribute of
their love to that which held the
seat of the life now gone.

Oct 20th. Ten hours of hard work
+ three miles gained. We built
the trail around the fallen mass
of rocks and a rough one it was
but by putting a spantail of the
hacks on June + Charlie we pulled
tho'. Another slight mending of
the trail to a camp at the mouth
of a canon entering from the
east, a hard day for man
and beast but soon to be forgotten
if we reach the Colorado to-
morrow. The rock is becoming
more shaly and little benches
form along the lower portions of the
canon walls. It is warm + pleasant
so that the tent will not be unpacked
tonight. Ben has killed a goat

of bread cooked morning and
dried beef & I guess we can
eat a good square meal as a piece
of dry bread & beef has amused
since breakfast at sunrise.

Oct 21st 1879.

Left camp early and reached
the Colorado at noon. No without
some rough road however as at
one place it was swimming stop
for the animals. But we are
home at last & I feel repaid
for the labor altho' I am about
used up tonight. Headached
at noon but that has passed
off. My right thumb nail is
coming off, result of a bruise & is
troublesome. a blow on the left
thumb with my stone hammer
consequent upon the right
being out of order, has healed
the end of that and in a

(15) Oct 23

The sun has set and twilight
is falling. A quart of half
tea and a large slice of raisin
bread ought to inspire me to write
but on the contrary I am lazy.

The ~~main~~ ^{inspiring} ~~house~~ ^{house} is grand and
to the right and left the Canon
walls rise in a clean cliff over
2000 feet. In front, down the
river a great mass of the outer
wall rises like an immense
castle pile falling to ruin.

Four thousand feet above to the
summit of its gray cap. To
night it is a great black mass,
yet small as compared with
the greater extent of Canon
walls beneath. By the light
of the moon we see the effect

from my seat is renewed. The
Canon is all gloom and shadow
& towering above it stands
our ruin. A silver gray mass
resting on the dark red rock
beneath. Projecting headlands
throw deep shadows and
from the buttresses supporting
the main mass. This is a
thousand feet high and twice
as thick as long. How small
it looks two miles away its base
a half a mile above the ruin.
The canon is far more
impressive to me now than
on first acquaintance. Its
great proportions and
ever changing features as
it is seen from different
points at various times of the

17.
day give me opportunity
for study & reflection. The
river is now low but the
water is a pink hue from
the contained sediment washed
in by recent rains away
of the country. Drinking from
it yesterday, the taste of
the clay was evident. To-day
we have a clear, running
brook coming down the Kanab
Canon for our use. Twilight
has faded into night and now
I am in our tent writing by the
"glimmer" as the "tallan dip" is often
called. My thoughts are improving,
and from present appearances
I shall finish my work here
sooner than I anticipated, and
dig out on up the Canon. If
possible I wish to go on there

at upper Kanab to remain the
stratigraphical work done there
last month. If I can find a
place up near the great natural
sponge that will permit of my
climbing to the top of the inner
wall, 1400 feet, I shall save a week
otherwise, dry camps and such
pleasant incidents will occur.

I wish to write to Ed to night
so will let this scribble answer
for to days addition to my notes
for Mather & Austin families.

(One note to fill this out.) The
peculiar softness of the atmosphere tends
to smooth and soften the sharp
edges and rugged outlines so that
at distance the rock scenery is
greatly improved by this factor.
Often, then, a cliff is quite
smooth but finds it broken on
near approach.

(17) Oct 24.

Worked up the Karab Canyon. Nothing
of special incident occurred. Found
that a part of Mr. Gilbert's limestone
series is sandstone.



a ten minute sketch of
my old ruined sketch.

It may be that I can get a
photograph of this point, as
the Photograph was down
here a few years ago. Well

do so if possible.

I am now gaining in energy & spirit and if nothing unforeseen occurs shall hope to push along so as to gain strength myself and keep the work in good control. One reason of depressing on arriving here was coming from a higher colder atmosphere to the lower level of warmer weather. Our food is now excellent. Beef, mutton, rice, dried fruit hold out in good order. We eat a loaf of bread per day weighing $2\frac{1}{2}$ to 3 pounds & plenty of other "truck" as Jerry called it. My meals are immense. Do not drink tea or coffee & have no desire for milk, butter or eggs. Pink Valley cured me of those articles for a time at least, would like potatoes tho'. Will have some too in

when possible to return to

will

(21)
Thursday eve.

The sun has just gone down
behind my old ruin and a half
hour remains ere darkness will
drive me in.

Jerry calls supper. O.K.!

Rich beef tea, rice, peaches. Bread
"To witch a wino".

To day has been a busy one. Up
the Colorado Canon a mile over
the rocks to examine strata. Return
to dinner & then up the Kanab
Canon to pencil away until 3.30
p.m. to obtain a few rare fossils.
Return to camp, put ferns in
press gathered on the way and
then up for a wash & reprieve.
Scrub, personal and washing
of stockings, towel etc, Mended
shirt, mended a patch on boots
& fixed up generally. And also
feeling tired this evening as not

feel at all unwell. Tomorrow
is Sunday but we shall leave
+ go up the canon a few miles.
The sooner we get above the bad
places the better. The barometer is
falling. Jerry's rheumatism speaks,
and to get caught down here
with high water above means
trouble. It may not rain in three
or four days but by that time
I hope to be above desolation
camp, as we called it. I shall
not be sorry to turn homeward.
This is a grand canon and
much there is that is beautiful
about it. Still I have seen it +
I think under favorable con-
ditions + am ready to leave
it. "Farewell forever! farewell forever!
To the wild Colorado with its
rapids + its rocks, it will trouble
us no more."

(23)
Last night, the light of the moon
awoke me about 3 o'clock. I got up &
went outside the tent, as I thought the
scene must be fine. I was not
mistaken. The weird effect of
the moonlight was to lighten the
gloom of the great canon and at
the same time to give its northern
walls a picturesque beauty that
no other light could give. The
shadows were deep and the solitary
angles bathed in the soft silvery
light made each separate cliff
a study by itself. The walls
appeared twice as high as by
daylight and almost seemed
to touch the stars on the eastern
side. It was a sight that
only an artist could picture
out before you. My few feeble
words cannot half express what
little I could see.

I am at the foot of the great

black cliff the ruin went rushing
roaring along I could not help
thinking of Dante's "Inferno" where
Dante has represented the dark
rushing ruin Styx. Soon this
will be all stored in memory's
walls and my trip to the Colorado
a thing of the past. There it will
be placed side by side with
that descent to a few other places
I treasure to think of when that
is left free to wander back
to the beautiful and striking
objects that have crossed my
little wanderings in this small
world small as it is I fear I shall
never compass its mysteries as hidden
in the lower rocks. Still to that I
would like to give my energy for
years to come. May perhaps it
it will be so. Who knows?

(25)
Sunday Oct 26th 1879.

We were up & eating breakfast at
Remiss & soon after were packing
up. All went smoothly until old
Billy, a poor old used up pack
horse, made a mistake going along
a narrow part of the trail. He
failed to recover & after turning
a complete summersault landed
down in a pool of water three
feet deep and lay there help-
less. By rolling him over he
gained his feet and we soon
had him out. Decided to camp
a mile above and when we
unpacked Billy's pack a nice
mess it was. Just as top some
my valises. Just as half web.
to the book. doing etc. sufficient
in web. Matches. pen. and

heavily soaked. Luckily the
opposite pack did not get
soaked & our flour & my pack
age of books escaped. The air
is very dry & all is ⁱⁿ order
again as far as can be.

The tent is up, the stones
chased away, dirt thrown
windows cut & laid over it
and my bed is in order. A
large flat rock serves for
a candlestick and table &
all is comfortable. It is
still warm. Last night I
slept. Kept one thickness
of blanket over me.

The cam is directly opposite
a spot in the canon wall
where I can get up to
three hundred feet and
carry up the station master

(28) Oct 29th 1879.

Nothing of special incident
has occurred the past three
days. We have made another
camp below desolation camp
& I have collected a lot
of fine fossils and also added
to the measured section. Have
taken several hard climbs up
the canon walls but cannot
get to the top yet. Tomorrow
I propose searching for
fossils & next day moving
out & up above all the bad
places. On our way up here
we passed the hole where
Old Billy set me in the water.
To night I write lying on
my side, head bolted up.
A boil on the knob of the
neck is under full headway

and is very painful. Hinders
me about my work. Last
Spring I had them because
I was run down. That cannot
be the reason now. Jerry
has just had a large one
on his neck & he is well
and strong. I wish it had
kept away a week longer.
It is severe work to climb and
+ pound with a hammer
when every blow + movement
hurts. Still it is nothing but
a job of comfort and can
be endured for a few days.
Jerry is getting homesick to get
out of this canon. He says he
wishes to get where he can
see something & see outside
of these rocky walls. I
cannot blame him very
much as it is not a cheerful
place by a long ways. (Good night)

Oct 31st 1879

Farewell October. To me you have been an eventful month in many ways and to night I bid you good bye willingly, still not without a sense of regret as your bright beautiful days have appealed to the higher æsthetic sense and more practically have enabled me to work with energy & comfortable surroundings. I bid bid you farewell.

At 8 a.m. we left camp. Jane carried the heavy pack & the other three animals the remainder of our worldly goods. Slowly and sure we wound in & out. up & down, around great boulders, through the water and after twice unpacking & once making a swim we reach our present camp at the natural sponge (mentioned when going down) above all the bad places and make the trail altho rough in places will

permit us to remain in the saddle until Kanab is reached. Ten weeks yesterday since we left. as provisions are running low we shall probably go in by the 7th or 8th of November.

The weather is warm & comfortable. The brook & the hanging spring make music that is pleasant to the ear & on this little grass plot our camp fire burns & the tent, our little home, is bright & pleasant.

I am getting quite accustomed to the manner of living and to day am more willing to remain out another month than since starting.

My boiler has reached its maximum development & is now on the decline.

Like some of

the folks of old

Jan 3rd 1859.

I worked all day Sunday and will push another day. Our provisions are nearly out & after to day will live on bread & a slice of bacon ^{per} day until we reach Karab. Under the circumstances working on Sunday was necessary if the work was done at all.

There remained one hard, dangerous climb to measure a section of limestone that hitherto had been guessed at as it was nearly inaccessible. Jerry accompanied me & we chose a cliff about two miles above camp as looking the most favorable. At the start there was a bad place but then better for 200 feet or so. The struggle commenced here as a reentering angle of the cliff gave a little hold & up nearly a perpendicular wall clinging to points jutting out

an ~~erick~~ a two, up the face of the cliff we went for over 200 feet & near the top found a spot where the rock overhung the only spot we could get up. It was hard to back out so I managed to get my hands up over & getting a hold swung out & pulled up over. a slip there would have sent me 400 feet as our path had taken us out over the steep face of the cliff below. I then helped Jerry & we were soon at the top.

By a line measured the section & then decided that we would rather walk ten miles up the canon rather than attempt the descent by the path we came up. Decided when we started off our rocks & rough ground as our path lay at the foot of the outer range of cliffs 2000 feet high. Two miles up we were

stopped by a side Canon. That
 we started to go up & around.
 At one place its walls were broken
 & we started down & struck an
 old Indian trail. After a rough
 climb we landed at the bottom
 of the canon, only to find our
 way stopped by a fall of 30 feet
 over a ledge in a very narrow
 place. Up the side & along
 narrow ledges 150 feet above the
 bottom & then down a place
 not any too safe & the base
 was reached again. Three
 miles scramble over the boulders
 & our animals were reached.
 Seven hours of hard work was
 over.

Evening.

To day have felt rather used
 up but did the work laid out
 & feel well to night. Tomorrow
 we start out for Karab. will

probably spend three days on
the way. We leave an unusually
pleasant camp to go north & of
2000 feet or more where it will
be cold & wintry. It is beauti-
tiful October weather here.

Just at sunset I took a bath
beneath the great sponge, as
we call it, letting the water
stream over me. (I will tell
you more of this sponge on my
return.) This will probably
close my long letter to you as
on the march there will be
no time to write & the tent is
not put up at night.

Please keep this as I may
wish to read it some time.

I shall register it as it has been
too much trouble to write it, to
have it lost.

Your affec^ted friend
Chas.

A.B. N^o 6 -

h. 5 bottom to h. 6. ✓

" 8 - 9. ✓

" 12 ✓

" 13. ¹⁴ Begin under left 20 on h. 12 ✓

" 15 ✓

" 16. - 18 - ✓

" 19 - sep - sheet for Shen ~~assess~~ - ✓

" 21 - Base of Lias? ✓

" ~~22 - 22.22.22~~ 22 - 37. ✓

" 40 ⁴¹ Note on wood etc ✓

" 43 ✓

" 44 - 47 ✓

" 48 - 51 ✓